CLEAN COPY OF CLAIMS AS CURRENTLY PRESENTED

1. A method for collecting, assimilating and utilizing data from a variety of sources for determining the regulatory requirements and for generating the related compliance reports for a specific facility in a given industry, the method comprising the steps of:

a. collecting external data externally generated from and unrelated to a specific facility but required for compliance requirements of a governmental compliance model;

b. collecting internal data uniquely associated with said facility and internally generated from said facility;

c. assimilating the external data and the internal data in a processor to determine compliance by the user;

d. automatically generating a report based on the assimilation, which report is unique to the facility and contains the required governmental compliance information.

2. The method of claim 1, wherein the external data is collected via the Internet.

3. The method of claim 1, wherein the compliance model is a government agency compliance requirement.

4. The method of claim 1, further including the step of electronically submitting the generated report to a relevant agency.

5. The method of claim 2, wherein the collected external data is industry specific.

6. The method of claim 1, wherein the collected internal data is facility specific.

7. The method of claim 1, wherein the collected internal data is equipment specific.

8. The method of claim 1, wherein the collected internal data is location specific.

9. The method of claim 2, further including the step of creating a library of available data from the collected external data and non-confidential portions of the collected internal data.

10. The method of claim 2, further including the steps of linking the external data to on-line databases and importing data from said databases into the collected external data.

11. The method of claim 2, wherein there is further included a mathematical database and wherein data in the collected external data and in the collected internal data is imported into the mathematical database for calculating compliance data in the generation of a report.

12. The method of claim 11, wherein the mathematical database is an air module database for calculating hydrocarbon emissions from a crude oil storage tank.

18. A method for collecting, assimilating and utilizing data from a variety of sources for determining the regulatory requirements of a specific facility and for generating the related compliance reports for an industry, the method comprising the steps of:

a. collecting external data generated externally from the specific facility and that is unrelated to the specific facility but that is required for compliance requirements of a compliance model for the specific facility;

b. collecting internal data from the specific facility;

c. assimilating the external data and the internal data in an air module mathematical database used for calculating hydrocarbon emissions from a crude oil storage tank so as to determine compliance by the specific facility, wherein the air module mathematical database includes the following primary calculation formulas for calculating emissions for valves, flanges, piping and compressor seals:

$$\sum_{i=1 \text{ to } n} \frac{EF_i\text{lb}}{\text{hr}_i} \times \frac{VOC\%_i}{1} \times \frac{24\text{ hrs}}{\text{day}} \times \frac{365\text{ days}}{\text{year}} \times \frac{1\text{ ton}}{2000\text{ lbs}} = \frac{\text{Emissions tons}}{\text{year}};$$

d. automatically generating a report unique to the specific facility and containing required compliance information.

24. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from storage tanks:

$$L_T = L_S + L_W$$

$$L_S = 365V_V\, W_V\, K_E\, K_S$$

$$V_V = \frac{\Pi}{4} D^2 (H_S - H_L + H_{RO})$$

$$W_V = \frac{M_V P_{VA}}{RT_{LA}}$$

$$T_{LA} = .044T_{AA} + 0.56T_B + 0.0079aI$$

$$T_B = T_{AA} + 6a - 1$$

$$K_E = \frac{dT_V}{T_{LA}} + \frac{dP_V - dP_B}{P_A - P_{VA}}$$

$$dT_V = .072dT_A + 0.028I$$

$$K_S = \frac{1}{1 + 0.053P_{VA}H_{VO}}$$

$$H_{VO} = H_S - H_L + H_{RO}$$

$$L_W = 0.0010M_V P_{VA} Q K_N K_P$$

wherein Π is a Pi (Constant dimensionless factor = 3.1415);

wherein a is a Tank paint solar absorbance factor (Dimensionless empirical factor which has been established through experience);

wherein D is a Tank diameter (Cross sectional linear measurement of the cylindrical tank. Units = linear);

wherein H_L is a Liquid Height (Average daily tank gauge reading which shows how much is in the tank. Units = linear (e.g. ft));

wherein H_{RO} is a Roof Outage (Linear measurement of tank roof height measured from the vertical edge of the tank shell to the top of the dome or coned roof. Units = linear (l));

wherein H_S is a Shell Height (Linear measurement of tank height excluding the height of the roof section of the tank. Units = linear (l));

wherein H_{VO} is a Vapor Space Outage (The height of the inside tank space minus the liquid level in linear units, e.g. ft);

wherein I is a daily solar insulation factor (Empirical factor based on tank materials and conditions. Units = BTU / ft^3 – day);

wherein K_E is a vapor space expansion factor (Dimensionless empirical factor used to calculate standing losses in Equation (1));

wherein K_N is a turnover factor (Dimensionless empirical factor);

wherein K_P is a Working loss product factor (Dimensionless empirical factor which is product specific, i.e. 0.75 for crude oil and 1.0 for all other organic liquids);

wherein K_S is a Vented Vapor Saturation Factor (Dimensionless factor used to calculate the Standing Storage Losses);

wherein L_S is a Standing Losses (Hydrocarbon air emissions from crude and condensate above ground storage tanks that are given off while the tank is standing idle (not filling and emptying) and contains some quantity of fluid. Measured in lbs/hr, lbs/day, and tons/year);

wherein L_T is a Total losses (Hydrocarbon air emissions from crude and condensate above ground storage tanks that are a sum of the working and standing losses as described above. Measured in lbs/hr, lbs/day, and tons/year);

wherein L_W is a Working Losses (Hydrocarbon air emissions from crude and condensate above ground storage tanks that are given off during operations (filling and emptying) and contains some quantity of fluid, measured in lbs/hr, lbs/day, and tons/year);

wherein M_V is a Vapor Molecular Weight (Molecular weight or the weight of an Avogadro's number of molecules of the gases in the vapor space volume. Units = mass/mole (e.g. lb/lb mole));

wherein P_A is a Atmospheric pressure (Standard ambient atmospheric pressure as measured via barometer, e.g. 14.7 psia);

wherein dP_B is a Breather vent pressure setting range (The range in pressures at which the tank vent or hatch will relieve under the pressure of its contents);

wherein dP_V is a Daily vapor pressure range (The range (or change) in the vapor pressure caused by the variance in maximum and minimum daily ambient temperatures. Provided by reference in pressure measurements);

wherein P_{VA} is a Vapor pressure (True vapor pressure of the liquid at the average liquid surface temperature wherein Units = force / unit area (f/l^2) ($lbs/inch^2$));

wherein Q is a Annual net production through-put (The annual volume of hydrocarbons, e.g. crude oil, that is stored in the tank being considered. This figure is taken from actual lease production volumes. Volumetric units, e.g. bbls);

wherein R is a Ideal Gas Constant (Ideal gas constant calculated as (standard atmospheric pressure – ideal molar volume of gas / mol – standard temperature) (e.g. psia – ft^3 / lb-mole - °R (Rankine) = 10.731));

wherein dT_A is a Daily average temperature range (°R , °K) (The difference between daily minimum and maximum temperatures taken from Table 12.3-6 as determined by regional location);

wherein T_{AA} is a Daily average ambient temperature (Average of daily maximum and minimum ambient temperatures. Measured in °R or °K.);

wherein T_B is a Liquid bulk temperature (Liquid bulk temperature at standard temp Units = °R or °K);

wherein T_{LA} is a Daily average liquid surface temperature (The average temperature measured at the surface of the liquid in the tank. In this case the temperature is calculated from ambient temperatures rather than measured. Units = °R (Rankin));

wherein dT_V is a Daily vapor temperature range (The daily range in temperature of the vapor in the vapor space of the tank as described above; calculated);

wherein V_V is a Vapor space volume (Volumetric calculation of the average amount of space in the tank (overhead) that is not occupied by liquids. Measurement = l^3); and

wherein W_V is a Vapor density (Calculated densities of the gases (vapors) in the vapor space calculated in equation (1)(a). Units = mass/unit volume (m/l^3) (e.g. lb/ft^3)).

25. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from internal combustion engines:

$$\sum_{i=1 \text{ to } n} \frac{EF_i g}{1 \text{ hp hr}} \times \frac{\text{Rated hp}_i}{1} \times \frac{24 \text{ hrs}}{\text{day}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ lb}}{453.6 \text{ g}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{\text{Emissions tons}}{\text{year}}$$

wherein EF is a Emission Factor g/hp/hr (The amount of an individual pollutant that will be generated per horse power hour of operation, e.g. 2.0 grams Nox generated in grams per hp per hour); and

wherein HP (hp) is a Horse power rating (The power rating of the compressor in horse power per hour).

26. The method of claim 12, wherein the primary formula is repeated for each of the following pollutants:

NOx (Nitrous Oxides) for Nitrous oxide emissions,
CO (Carbon Monoxide) for Carbon monoxide emissions,
SO_2 (Sulfur dioxide) for Sulfur dioxide emissions,
PA or PM_{10} (Particulates) for Particulate emission from fuel combustion, and
VOCnm (Non-methane Volatile Organic Compounds) for Measurement of emissions of VOC's as tons per year.

27. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from external combustion units:

$$\sum_{i=1 \text{ to } n} \frac{\text{mmBTUi}}{\text{hr}} \times \frac{1 \text{ SCF}}{\text{Fuel Heat Value in BTU}} \times \frac{\text{EF lbs}}{\text{mmSCF}} \times \frac{24 \text{ hrs}}{\text{day}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{\text{Emissions tons}}{\text{year}}$$

wherein EF is an Emission Factor (lb / mmscf) (amount of pollutant species generated per unit of fuel used or burned, e.g. lbs (pounds) per mmscf (Million standard cubic feet) of gas burned); and

wherein mmbtu is a BTU rating of the unit (the size of the combustion unit as measured in BTU's per hour. Mmbtu = million British Thermal Units).

28. The method of claim 12, wherein the primary formula is repeated for each of the following pollutants:

NO_x (Nitrous Oxides) for nitrous oxide emissions,

CO (Carbon Monoxide) for carbon monoxide emissions,

SO_2. (Sulfur dioxide) for sulfur dioxide emissions,

PA or PM_{10} (Particulates) for particulate emission from fuel combustion, and

VOCnm (Non-methane Volatile Organic Compounds) for measurement of emissions of VOC's as tons per year.

29. The method of claim 28, wherein the primary formula is repeated for each piece of equipment located at the facility and for which a report is required:

EF (Emission Factor) for amount of volatile organic emissions generated per fugitive component or source. E.G. lbs / hr / source;

No. of components, (src) (Number of Components) for actual number of each source component at the facility (e.g. 355 valves); and

VOC% (VOC Concentration in the affected stream) for the concentration of VOC (volatile organic hydrocarbon compounds) defined as any compound with C3+ hydrocarbons as identified in the gas analysis and as calculated by volume %.

30. The method of claim 28, wherein the mathematical database includes the primary calculation formula for calculating emissions for glycol dehydration units, wherein:

Unit Description (Case name and case description used to retrieve case files from the GRI program. This name will also be identified by a facility ID number and an equipment ID number.);

Annual Hours of Operation (Number of hours the unit operates annually, e.g. 8760 hrs = 1 year.);

Gas Composition (Percentages of all components in the gas stream. Individual values input separately from gas analysis.);

Wherein Mmscf /day is a dry gas flow rate (The volumetric flow of the sales gas stream in volumetric units per day (e.g. mmscf/day or million standard cubic feet per day);

Wherein lb / mmwscf is a dry gas water content (The target final concentration of water in the sales gas stream, in the USA the default value is 7.0 lb / mmscf.);

Absorber stages (Number of actual equilibrium stages in the contactor; may be chosen, if known, by the user as an alternative entry to the dry gas water content described above.);

Lean TEG/ EG flow rate (The pumping rate of the lean or fresh tri-ethylene glycol (or ethylene glycol) solution in gallons per minute.);

Water content (The allowable water concentration in the lean or fresh glycol stream. A default value of 1.5% may be chosen if the user does not have this value.);

Re-circulation ratio (The gallons of glycol solution circulated per pound of water removed from the wet gas stream if known. May be chosen in place of the lean TEG/EG flow rate. Default value of 0.3 may be chosen in the program.);

Wet gas temperature (Temperature of the incoming wet gas stream in °F.);

Wet gas pressure (Pressure of the incoming wet gas stream in psig.);

Glycol pump type (May be gas driven or electric.);

Wherein ACFM / gal is a Gas driven pump volume ratio (ACFM (air cubic feet per minute) gas / gallon per minute glycol pumped (only for gas driven pumps). May choose

default values of 0.03 for wet gas pressures greater than 40 psig and 0.08 for units with wet gas pressures less than 400 psig.);

Flash Tank (Yes or no question. Is a flash tank involved with this unit.);

Flash tank temperature (Operating temperature of the flash tank if used in °Fahrenheit (°F).);

wherein PSIG is a Flash tank pressure (Operating pressure of the flash tank if used. Psig (pounds per square inch gauge).);

Stripping gas option (Yes or no question. Is a gas stream used to remove the hydrocarbons from the glycol vent stream?);

Stripping gas flow rate (Flow rate of the stripping gas stream, scfm);

Control device option (Choose a control device as either a vent condenser or vapor incinerator, or choose no control device.);

Vent condenser temperature (Operating temperature of the vent condenser (if used) in °F);

Vent condenser pressure (Operating pressure of the vent condenser (if used) in absolute pressure, e.g. psia);

Incinerator ambient air temperature (Average ambient air temperature for the location in °F);

Excess oxygen (% excess oxygen used in combustion process if a vapor incinerator is chosen as a control device.);

Combustion efficiency (% efficiency of the vapor control incinerator unit.)

wherein VOCs is a Volatile Organic Compounds (Measurement of emissions of VOC's as tons per year from the Glycalc Program Printout in tons/year.);

wherein HAPs is a Hazardous Air Pollutants (Volumetric measurement of a group of air constituents that have been determined by the Environmental Protection Agency (EPA) to be considered categorically hazardous to health and the human environment. Measured in tons/year).

31. A method for collecting, assimilating and utilizing data from a variety of sources for determining the regulatory requirements of a specific facility and for generating the related compliance reports for an industry, the method comprising the steps of:

a. collecting external data required for compliance requirements of a compliance model for the specific facility, wherein the external data is generated from sources unrelated to the specific facility and external to the specific facility;

b. collecting internal data from the specific facility, wherein the internal data is generated from specific conditions existing at the facility;

c. assimilating the external data and the internal data in an air module mathematical database used for calculating hydrocarbon emissions from a crude oil storage tank so as to determine compliance by the facility, wherein the air module mathematical database includes the following primary calculation formulas for calculating flash emissions caused by the transfer of higher pressure liquids from a process vessel to a storage tank of less pressure:

$$\log R_{st} = 0.4896 - 4.916 \log \gamma_{ost} + 3.496 \log \gamma_{sp} + 1.501 \log P_{sp} - 0.9213 \log T_{sp}$$

and the Vasquez Beggs GOR Correlation.

$$GOR = C1 \times SG100 \times (P_{str} + P_{atm})^{C2} \times e^{\frac{C3 \times {}^{\circ}API}{Tgas\,{}^{\circ}F + 460}}$$

$$SG100 = SG \times (1.0 + 5.912 \times 10^{-5} \times T_{gas}{}^{\circ}F \times \log \frac{P_{sep} + P_{atm}}{114.7}$$

wherein R_{st} is a Stock Tank Gas Oil Ratio (GOR) (The ratio of the volume of gas generated per barrel of oil produced as a result of the pressure drop between the pressurized separator and the oil storage (stock) tank. Units = volume gas / volume oil, e.g. standard cubic feet / barrel);

wherein Γ_{ost} is a Stock Tank Oil specific gravity (Measurement of the ratio of the weight of the oil relative to water at standard temperature and pressure. E.g. units = lb/gal per lb/gal or SG=6.5 lb/gal oil / 8.34 lb/gal water @STP=0.78);

wherein γ_{sp} is a Separator specific gravity (Measurement of the ratio of the weight of the air relative to);

wherein P_{sp} is a Separator pressure (The operating pressure of the vessel used to separate the oil, water and gas in the produced fluid stream);

wherein T_{sp} is a Separator temperature (The operating temperature of the separator measured in °F);

wherein V_{MW} is a Vapor Molecular Weight (The weight of one mole (or Avogadro's number of molecules) of the gas being measured.);

wherein C1, C2, C3 is a Vasquez Beggs Constants (Constants calculated for the use in this relationship using statistical empirical data. Dimensionless);

wherein SG is a Specific Gravity of the gas (Same as γ_{sp} or separator specific gravity as described above.);

wherein SG100 is a Specific Gravity of the gas referenced to 100 psig (A calculated quantity based on the temperature and pressure measured at the separator referenced to 100 pounds per square inch gauge (psig) pressure.);

wherein P_{str} is a Pressure of the upstream fluid (Pressure of the fluid stream as it leaves the separator or the separator pressure.);

wherein P_{atm} is Atmospheric pressure (The measured pressure of ambient conditions or in the atmosphere outside the separator.);

wherein T_{gas} is a Gas temperature at the separator (The measured temperature of the gas stream in the separator);

wherein P_{sep} is a Separator Pressure (The operating pressure of the separator measured in psig);

wherein psig is a Pounds per square inch gauge (Pressure measurements in units of pounds per square inch or in general units – f/l^2.);

wherein °API is a Degrees API gravity (The measured API gravity of the fluid (crude) being measured as calculated by a standard equation which ratios the specific gravity of the fluid to a referenced standard.);

wherein °F is a Degrees Fahrenheit (The standard temperature measurement using degrees Fahrenheit as a scale.); and

wherein log is a Logarithm (Mathematical relationship which equals the exponent value that the number 10 would be raised to get that same number.)

d. automatically generating a report unique to the facility and containing required compliance information.

32. A method for collecting, assimilating and utilizing data from a variety of sources for determining the regulatory requirements for a specific facility and for generating the related industry compliance reports for the facility, the method comprising the steps of:

a. collecting external data required for compliance requirements of a compliance model for the specific facility, wherein the external data is generated from sources unrelated to the specific facility and external to the specific facility;

b. collecting internal data from the specific facility, wherein the internal data is generated from specific conditions existing at the facility;

c. assimilating the external data and the internal data in an air module mathematical database used for calculating hydrocarbon emissions from a crude oil storage tank so as to determine compliance by the facility, wherein the air module mathematical database includes the following primary calculation formulas for calculating loading loss emissions:

$$L_L = 12.46 \frac{SPM}{T}$$

wherein L_L is a Loading losses – VOC (The Volatile Organic Compound (VOC) emissions quantity as determined in the above equation.);

wherein S is a Saturation factor (Empirical quantity for calculation);

wherein P is a True liquid vapor pressure of the liquid being loaded (The true vapor pressure of the liquid being loaded which is the pressure at which the liquid is in equilibrium with the overhead vapors. Measured in pounds per square inch atmospheric (psia));

wherein M is a Vapor Molecular Weight (The weight per mole of gases being emitted, e.g. lb/lb mole. One mole = weight of 10^{23} molecules (Avogadro's number) of the gas or 359 standard cubic feet. (SCF)); and

wherein T is a Bulk Liquid Temperature (The temperature of the liquid being loaded in °R (Rankine) = °F + 460.)

d. automatically generating a report unique to the facility and containing required compliance information.

33. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating emission fees:

$$\sum \text{Emissions} \frac{\text{tons}}{\text{year}} \text{ x \$ per ton} = \text{Annual Emissions Fee}$$

wherein $ is a Price per ton (The dollar price per tons of emissions as established by the particular state of operation);

wherein NOx is a Nitrous Oxides (Nitrous oxide emissions);

wherein CO is a Carbon Monoxide (Carbon monoxide emissions);

wherein O_2 Sis a Sulfur dioxide (Sulfur dioxide emissions);

wherein PA or PM_{10} is a Particulates (Particulate emission from fuel combustion); and

wherein VOCs is a Volatile Organic Compounds (VOC emissions).